

cannot grasp the relationship between the Examiner's explanations and the passage indicated. Thus, the Applicants cannot grasp the rationale behind the rejection.

In any event, the Applicants understand that Clark '690 does not reach or suggest that the position of each deposition mask can be adjusted respectively relative to the base plate (frame 22) independently of the other deposition masks.

The reason is that there are other teachings in Clark '690. For example, Col. 1, lines 54 – 57 recites: "These objects are achieved in an alignment and holding device for permitting a deposition mask having a plurality of magnetic mask segments to be mounted to a frame for positioning relative to a substrate." Col. 3, lines 15 – 20 recites: "On the deposition mask 12 there are four segments 12a, 12b, 12c, 12d (see Figs. 1 and 2). The mask segments are initially aligned with engraved lines 19 on frame 20 when the deposition magnetic mask segments 12a, 12b, 12c, 12d are positioned." Col. 4, lines 29 – 32 recites: "The magnetic mask segments 12a, 12b, 12c, 12d are visually aligned on top of plates segments 20 and frame 22 using engraved alignment lines 19 on frame 22 for initial alignment as shown in Fig. 2."

The passages cited above and their teachings means that each of the mask segments is set on the frame (base plate) 22 along the engraved lines 19 as a whole in contact with each other at their respective edges (see Fig. 1). Further, in no other location does Clark '690 disclose that each of the mask segments 12a, 12b, 12c, 12d can be positioned with adjustment relative to the frame (base plate) 22 one by one independently of the other mask segments.

The rejection further relies on Schweitzer '282 to show that adjusting the position between the base plate and the masks prior to engaging the integrated mask with the single substrate was known. However, the Schweitzer '282 base plate (mask plate 44) having a plurality of separate openings 110a – 110h, each of which is adapted to receive a plurality of mask 111a – 111h, respectively, is quite different from the claimed base plate.

The plurality of masks 111a – 111h retained on the base plate (mask plate 44) in Schweitzer ‘282 are used to form a device by vacuum evaporation on each of the substrates 107a – 107h (Fig. 7) independently of each other and set on each of the substrate holders 70a – 70h disposed at each of the ports 68a – 68h provided in the substrate plate 40. In other words, Schweitzer ‘282 teaches that the plurality of masks 111a – 111h correspond to the plurality of substrates 107a – 107h set on the plurality of substrate holders 70a – 70h, respectively. Consequently, the base plate (mask plate 44) of Schweitzer ‘282 is not for a base plate used in combination with a single substrate as claimed by the Applicants.

This means that Schweitzer ‘282 has no alignment system for adjusting the relative position between the base plate (mask plate 44) and each of the masks 111a – 111h. Schweitzer ‘282 only has an alignment system for adjusting the relative position between each of the masks 111a – 111h and each of the substrates 107a – 107h which comprises the pair of spaced pins 112 and 114 projecting from the base plate (mask plate 44) and the V-groove 76 formed in the frame 74 of each of the substrate holders 70a – 70h to receive the pins 112 and the truncated V-groove 78 formed in the frame of each of the substrate holders 70a – 70h to receive the pins 114.

This means that Schweitzer ‘282 uses a plurality of masks 111a – 111h, but does not produce a single substrate having a plurality of devices formed thereon by a plurality of masks. This also means that Schweitzer ‘282 uses an alignment between each of the masks 111a – 111h and each of the substrates 107a – 107h set on the substrate holders 70a – 70h, but has no alignment between each of the masks 111a – 111h and the base plate (mask plate 44). Therefore, Schweitzer ‘282 does not teach or suggest adjusting the position between the base plate (mask plate 44) and each of the masks 111a – 111h.

The rejection relies on the notion that adjusting the position between the base plate and the masks prior to engaging the integrated mask with the substrate is a change in the order of

performing process steps and is *prima facie* obvious. This approach is overly simplified and does not consider all relevant aspects of the claims.

The Applicants wish that the claim contain an important feature: “a single substrate.” After completion of alignment between the base plate and the single substrate, the single substrate is positioned above the base plate on which a plurality of masks is disposed. Therefore, in the solicited claims, adjusting the position between the base plate and the masks prior to engaging the integrated mask with the substrate is selectively adopted.

In light of the above, the Applicants respectfully request that the reasoning that the order of aligning the masks and engaging the integrated mask with the substrate is merely a change in the order of performing process steps is *prima facie* obvious be reconsidered and withdrawn.

The rejection also notes that Schweitzer ‘282 teaches that each mask 111 is independently placed and retained over a separate opening 110. However, in Schweitzer ‘282, each mask 111 provided on the base plate (mask plate 44) is used one by one to deposit material on each substrate 107 through a single opening 116 provided in the shutter plate 48 step by step. Although Schweitzer ‘282 teaches the base plate (mask plate 44) having a plurality of masks 111a – 111h, each of the masks 111 is used for deposition of each substrate 107 through the single opening 116, not for a single substrate on which a plurality of devices is formed at once. Therefore, one skilled in the art is not given any real motivation to combine Schweitzer ‘282 with Clark ‘690.

The rejection also relies on Tang ‘961 and recites that Tang ‘961 teaches using the alignment mark on the mask to align the mask and substrate for the deposition of EL devices. In this context, the Applicants understand that the mask corresponds to one of the claimed deposition masks. If the Applicants’ understanding is correct, there is no step of aligning each of

the deposition masks and the single substrate. The Applicants claim steps of aligning each of the deposition masks and the base plate, and aligning the base plate and the single substrate.

The rejection further relies on Duggal '661 and explains that Duggal '661 teaches the provision of more than one EL device on the same substrate by evaporating the EL material through a shadow mask.

The Applicants have carefully studied the entirety of Duggal '661. Many methods of making a light emitting device are disclosed therein, especially in the passages from [0094] to [0110]. However, it is not taught or suggested in Duggal '661 what kind of shadow mask is used in those methods. Whether the shadow mask is in a type of a plurality of shadow masks disposed on a base plate or not, is simply not known. The Applicants believe that one skilled in the art is not provided with even a hint to have used the deposition mask of Clark '690 to have deposited more than one EL device on the same substrate from Clark '690 and Duggal '661. This is because, as explained above, Clark '690 discloses only that each of the mask corresponds to each of the substrates one by one and Duggal '661 only discloses the words "shadow mask" and does not disclose an actual construction of the shadow mask. The Applicants therefore respectfully submit that, even if one skilled in the art were to make the hypothetical combination, the resulting combination would still fail to teach or suggest the subject matter as recited in Claim 12. Withdrawal of the rejection is respectfully requested.

The Applicants acknowledge the rejection of Claim 12 under 35 U.S.C. §103 over the hypothetical combination of Schweitzer '282, Tang '961 and Duggal '661 with Clark '382. The Applicants respectfully submit that, even if one skilled in the art were to make the hypothetical combination, the resulting methodology would still fail to teach or suggest the subject matter of Claim 12. Reasons are set forth below.

The differences between Clark '382 and Clark '690 are on the points that the base plate (frame 22) in the latter (Clark '690) has openings 24a – 24b, engraved alignment lines 19 and a magnetic cross bar channel 30. The formation of a deposition mask comprising a plurality of mask segments each of which is arranged in contact with each other at the respective edges in both (Clark '382 and Clark '690) are the same. Therefore, both (Clark '382 and Clark '690) do not teach or suggest that the position of each mask 12 is adjusted relative to the base plate (frame 22) independently of the other masks.

As a consequence of the differences set forth above with respect to Clark '382 and Clark '690, it can readily be seen that, hypothetically substituting Clark '382 in place of Clark '690 for a possible hypothetical combination with Duggal '661, Tang '961 and Schweitzer '282, nothing changes. The combination utilizing Clark '382 in place of Clark '690 still fails to teach or suggest the subject matter of Claim 12. Withdrawal of that rejection is also respectfully requested.

The Applicants note the rejection of Claim 13 under 35 U.S.C. §103 over the hypothetical combination of Tang '961, Duggal '661 and Nagayama '055 with Clark '690. The Applicants have already established the inapplicability of Tang '961, Duggal '661 and Clark '690 above. This rejection further relies on Nagayama '055. However, Nagayama '055 fails to provide additional teachings that would cure the deficiencies set forth above with respect to the other primary and secondary references. Withdrawal of the rejection is respectfully requested.

The Applicants note the rejection of Claim 13 under 35 U.S.C. §103 over the hypothetical combination of Schweitzer '282, Tang '961 and Duggal '661 and Nagayama '055 with Clark '382. The Applicants respectfully request withdrawal of that rejection for the same reasons set forth above with respect to the rejection of Claim 12 based on Clark '382.

The Applicants note the rejection of Claims 11-12 and 14 under 35 U.S.C. §103 over the hypothetical combination Schweitzer '282, Tang '961, Duggal '661 and Boudreau '057. The Applicants respectfully submit that one skilled in the art would not make the hypothetical combination of the four separate and unrelated references, but in any event, that even if the hypothetical combination were to be made, the resulting methodology would still fail to teach or suggest the subject matter of Claims 11-12 and 14 for the reasons set forth in detail below.

As frankly acknowledged by the Examiner, Boudreau '057 does not disclose positioning an integrated mask and a single substrate to be subjected to a deposition process in a deposition chamber using alignment marks formed on the integrated mask and the single substrate. However, the combination of the integrated mask and the single substrate is an important aspect of Claims 11-12 and 14 in forming a plurality of EL devices on the single substrate.

Boudreau '057 discloses a mask holder 12 and a plurality of masks 20 each of which corresponds to a substrate 32. In Fig. 1 of Boudreau '057, the left hand mask 20 and the left hand substrate 32, that is, one pair of mask 20 and substrate 32 is aligned with a first combination of the primary datum pins 28 and the primary datum apertures 34 and a second combination of the secondary datum pins 36 and the mask alignment apertures 24. The right hand mask 20 and the right hand substrate 32, that is, the other pair of mask 20 and substrate 32 is also aligned with the other first combination of the primary datum pins 28 and the primary datum apertures 34 and the other second combination of the secondary datum pins 36 and the mask alignment apertures 24.

Boudreau '057, therefore, does not teach or suggest a plurality of masks corresponding to a single substrate. As a result, (i) Boudreau '057 does not teach or suggest an alignment system between the mask 20 and the mask holder 12 or the mask frame 14, (ii) Boudreau '057 does not teach or suggest alignment mark formed on the mask frame (base plate) 14, (iii) Boudreau '057

does not teach or suggest detecting the alignment marks of the mask frame (base plate) 14 and each of the masks 20, and adjusting the relative position between the mask frame (base plate) 14 and each of the masks (20) prior to engaging the mask holder 12 with the substrate carrier 30 by independently retaining and independently moving each of the masks 20 relative to the mask frame (base plate) 14, and (iv) Boudreau '057 does not teach or suggest retaining each of the masks 20 on the mask frame (base plate) 14 using engaging units after adjusting of the relative position.

The rejection relies on newly cited Schweitzer '282 to show that it is known in the art that each mask is independently placed and retained over a separate opening. However, the mask plate (base plate) 44 in Schweitzer '282 having a plurality of separate openings 110 each of which is adapted to receive a mask 111 is quite different from the base plate of Claims 11-12 and 14.

This is because the plurality of masks 111a-111h retained on the mask plate (base plate) 44 of Schweitzer '282 is used to form a device by vacuum evaporation on each of the substrates 107 (Fig. 7) set on each of the substrate holders 70a-70h disposed at each of the ports 68a-68h provided in the substrate plate 40. Said differently, the plurality of masks 111a-111h in Schweitzer '282 corresponds to the plurality of substrates 107 set on the plurality of substrate holders 70a-70h, respectively. This means that the mask plate (base plate) 44 of Schweitzer '282 is not a base plate used in combination with a single substrate as in Claims 11-12 and 14.

As a result, Schweitzer '282 has no alignment system to adjust the relative position between the mask plate (base plate) 44 and each of the masks 111. Instead, Schweitzer '282 only has an alignment system to adjust the relative position between each of the masks 111 and each of the substrates 107. The system comprises a pair of spaced pins 112 and 114 projecting from the mask plate (base plate) 44 and the V-groove 76 formed in the frame 74 of the substrate

holder 70 to receive the pin 112 and the truncated V-groove 78 formed in the frame 74 of the substrate holder 70 to receive the pin 114.

That construction means that Schweitzer '282 uses a plurality of masks 111a-111h, but does not produce a single substrate forming a plurality of devices thereon by a plurality of masks. It further means that Schweitzer uses an alignment means between each of the masks 111a-111h and each of the substrates 107 set on each of the substrate holders 70a-70h, but has no alignment between each of the masks 111a-111h and the mask plate (base plate) 44. Those constructions are quite similar to the construction of Boudreau '057.

This is critical because it means that both Boudreau '057 and Schweitzer '282 do not teach or suggest using a single substrate in combination with a plurality of masks as recited in Claims 11-12 and 14. The Applicants therefore respectfully submit that one skilled in the art would not try to combine Boudreau and Schweitzer to solve the problem of producing a single substrate having a plurality of devices thereon. In any event, the hypothetical combination would still fail to teach or suggest the claimed single substrate in combination with a plurality of masks.

The Examiner also frankly acknowledged that Boudreau '057 does not teach or suggest adjusting the position between the base plate and the masks prior to engaging the integrated mask with the substrate. Thus, the rejection looks to Tang '961 and Schweitzer '282.

Tang '961 has serious problems since it discloses only a relationship between one mask 12 and one substrate 10. Tang '961, explains at Col. 6, Lines 50-54 that the orientation marks 52 on the mask 50 are used to position the mask 50 in an orientation relationship with the substrate 10, which has a spatially matching or coincident set of orientation marks (not shown). This means to one skilled in the art that Tang '961 teaches an alignment only between the mask 50 and the substrate 10. Further, Tang '961 does not disclose a base plate providing a mask.

Therefore, Tang '961 does not teach or suggest an alignment between a base plate and a mask. Of course, Tang '961 also does not teach or suggest an alignment between a base plate and each of a plurality of masks disposed respectively on the base plate.

This inherently means that Tang '961 does not teach or suggest adjusting the position between the base plate and the masks prior to engaging the integrated mask with the single substrate on which a plurality of devices is formed at once with the plurality of masks adjusted on the base plate.

The Applicants have already established that Schweitzer '282 is inapplicable. Therefore, the Applicants respectfully submit that the comments in the rejection that any order of performing process steps is *prima facie* obvious, particularly in view of the teaching of Tang '961 and Schweitzer '282, can not be maintained.

Further, the rejection comments that adjusting the position between the base plate and the masks prior to engaging the integrated mask with the substrate is nothing more than adjusting the steps in the process and such adjustment of the order of performing process steps is *prima facie* obvious. The Applicants invite the Examiner's attention to the claimed feature of "a single substrate". After completion of alignment between the base plate and the single substrate, the single substrate is positioned above the base plate on which a plurality of masks is disposed. Therefore, in Claims 11-12 and 14, adjusting the position between the base plate and the masks prior to engaging the integrated mask with the substrate is selectively adopted.

The rejection relies on Duggal '661 to show the provision that more than one EL device may be on the same substrate by evaporating the EL material through a shadow mask. The Applicants have carefully studied the entire text of Duggal '661. Many methods of making a light emitting device are disclosed therein, especially in the passages from [0094] to [0110]. However, Duggal '661 does not teach or suggest what kind of shadow mask is used in those

methods. Whether the shadow mask is a type of a plurality of shadow masks disposed on a base plate or not is utterly unknown. The Applicants respectfully submit that one skilled in the art is not even given a hint to have used the deposition mask of Boudreau '057 to have deposited more than one EL device on the same substrate from Boudreau '057 and Duggal '661. This is because, as explained above, Boudreau '057 discloses only that each of the masks corresponds each of the substrates and, further, Duggal '661 discloses only the notion of a shadow mask, but, importantly does not disclose an actual construction of the shadow mask.

The Applicants respectfully submit that even if one skilled in the art were to make the hypothetical combination of the three secondary references with Boudreau '057, the resulting methodology would still fail to teach or suggest the subject matter of Claims 11-12 and 14. Withdrawal of the rejection is respectfully requested.

The Applicants note the rejection of Claim 13 under 35 U.S.C. §103 over the hypothetical combination of Schweitzer '282, Tang '961, Duggal '661 and Nagayama '055 with Boudreau '057. The Applicants respectfully submit that further hypothetically combining the Nagayama '055 references with the three secondary references and the primary reference would still fail to cure the deficiencies set forth above with respect to the three secondary references and the primary reference. Accordingly, the Applicants respectfully request withdrawal of the rejection of Claim 13.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



T. Daniel Christenbury
Reg. No. 31,750

TDC:nn
(215) 656-3381